

SEQUENCE LISTING

<110> Winslow, Barbara J.
Cochran, Mark D.

<120> Recombinant Virus Expressing Foreign DNA Encoding
Feline CD80, Feline CD86, Feline CD28, Feline CTLA-4 or
Feline Interferon-gama And Uses Thereof

<130> 54957-B

<140> Not Yet Known

<141> 1999-04-30

<150> 60/083,870

<151> 1998-05-01

<160> 82

<170> PatentIn Ver. 2.0

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<211> 941

<212> DNA

<213> feline CD80

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<222> (1)..(876)

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Pro Lys Leu Phe Pro Leu Leu Met Leu Ala Ser Leu Phe Tyr Phe Cys	
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tca ggt atc atc cag ggg aac aag aca gtg gaa gaa gta gca gta cta	144
Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu	
35 40 45	

tcc tgt gat tac aac att tcc acc aaa gaa ctg acg gaa att cga atc	192
Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile	
50 55 60	

tat tgg caa aag gat gat gaa atg gtg ttg gct gtc atg tct ggc aaa	240
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*Cancelled
Per
Amend B*

09303510.043099

09303510-043069

Tyr	Trp	Gln	Lys	Asp	Asp	Glu	Met	Val	Leu	Ala	Val	Met	Ser	Gly	Lys	
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gta	caa	gtg	tgg	ccc	aag	tac	aag	aac	cgc	aca	ttc	act	gac	gtc	acc	288
Val	Gln	Val	Trp	Pro	Lys	Tyr	Lys	Asn	Arg	Thr	Phe	Thr	Asp	Val	Thr	
				85					90					95		
gat	aac	cac	tcc	att	gtg	atc	atg	gct	ctg	cgc	ctg	tca	gac	aat	ggc	336
Asp	Asn	His	Ser	Ile	Val	Ile	Met	Ala	Leu	Arg	Leu	Ser	Asp	Asn	Gly	
			100					105					110			
aaa	tac	act	tgt	att	att	caa	aag	att	gaa	aaa	ggg	tct	tac	aaa	gtg	384
Lys	Tyr	Thr	Cys	Ile	Ile	Gln	Lys	Ile	Glu	Lys	Gly	Ser	Tyr	Lys	Val	
		115					120					125				
aaa	cac	ctg	act	tcg	gtg	atg	tta	ttg	gtc	aga	gct	gac	ttc	cct	gtc	432
Lys	His	Leu	Thr	Ser	Val	Met	Leu	Leu	Val	Arg	Ala	Asp	Phe	Pro	Val	
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cct	agt	ata	act	gat	ctt	gga	aat	cca	tct	cat	aac	atc	aaa	agg	ata	480
Pro	Ser	Ile	Thr	Asp	Leu	Gly	Asn	Pro	Ser	His	Asn	Ile	Lys	Arg	Ile	
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				165					170					175		
gaa	aat	gaa	gaa	gaa	tta	aat	gcc	atc	aac	aca	aca	gtt	tcc	caa	gat	576
Glu	Asn	Glu	Glu	Glu	Leu	Asn	Ala	Ile	Asn	Thr	Thr	Val	Ser	Gln	Asp	
		180					185						190			
cct	gaa	act	gag	ctc	tac	act	att	agc	agt	gaa	ctg	gat	ttc	aat	atg	624
Pro	Glu	Thr	Glu	Leu	Tyr	Thr	Ile	Ser	Ser	Glu	Leu	Asp	Phe	Asn	Met	
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Thr	Asn	Asn	His	Ser	Phe	Leu	Cys	Leu	Val	Lys	Tyr	Gly	Asn	Leu	Leu	
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Val	Ser	Gln	Ile	Phe	Asn	Trp	Gln	Lys	Ser	Glu	Pro	Gln	Pro	Ser	Asn	
225				230					235					240		
aat	cag	ctc	tgg	atc	att	atc	ctg	agc	tca	gta	gta	agt	ggg	att	gtt	768
Asn	Gln	Leu	Trp	Ile	Ile	Ile	Leu	Ser	Ser	Val	Val	Ser	Gly	Ile	Val	
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Val Ile Thr Ala Leu Thr Leu Arg Cys Leu Val His Arg Pro Ala Ala
260 265 270

agg tgg aga caa aga gaa atg ggg aga gcg cgg aaa tgg aaa aga tct 864
Arg Trp Arg Gln Arg Glu Met Gly Arg Ala Arg Lys Trp Lys Arg Ser
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His Leu Ser Thr
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35 40 45

Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile
50 55 60

Tyr Trp Gln Lys Asp Asp Glu Met Val Leu Ala Val Met Ser Gly Lys
65 70 75 80

Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr
85 90 95

Asp Asn His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly
100 105 110

Lys Tyr Thr Cys Ile Ile Gln Lys Ile Glu Lys Gly Ser Tyr Lys Val
115 120 125

Lys His Leu Thr Ser Val Met Leu Leu Val Arg Ala Asp Phe Pro Val
130 135 140

Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His Asn Ile Lys Arg Ile

145

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Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu	
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Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile	
50 55 60	
tat tgg caa aag gat gat gaa atg gtg ttg gct gtc atg tct ggc aaa	240
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Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr	
85 90 95	
gat aac cac tcc att gtg atc atg gct ctg cgc ctg tca gac aat ggc	336
Asp Asn His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly	
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aaa tac act tgt atc att caa aag att caa aaa ggg tct tac aaa gtg	384
Lys Tyr Thr Cys Ile Ile Gln Lys Ile Gln Lys Gly Ser Tyr Lys Val	
115 120 125	
aaa cac ctg act tcg gtg atg tta ttg gtc aga gct gac ttc cct gtc	432
Lys His Leu Thr Ser Val Met Leu Leu Val Arg Ala Asp Phe Pro Val	
130 135 140	
cct agt ata act gat ctt gga aat cca tct cat aac atc aaa agg ata	480
Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His Asn Ile Lys Arg Ile	
145 150 155 160	
atg tgc tta act tct gga ggt ttt cca aag cct cac ctc tcc tgg ctg	528
Met Cys Leu Thr Ser Gly Gly Phe Pro Lys Pro His Leu Ser Trp Leu	
165 170 175	
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Glu Asn Glu Glu Glu Leu Asn Ala Ile Asn Thr Thr Val Ser Gln Asp	
180 185 190	
cct gaa act gag ctc tac act att agc agt gaa ctg gat ttc aat atg	624
Pro Glu Thr Glu Leu Tyr Thr Ile Ser Ser Glu Leu Asp Phe Asn Met	
195 200 205	
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Thr Asn Asn His Ser Phe Leu Cys Leu Val Lys Tyr Gly Asn Leu Ile	
210 215 220	

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Val Ser Gln Ile Phe Asn Trp Gln Lys Ser Glu Pro Gln Pro Ser Asn
225 230 235 240

aat cag ctc tgg atc att atc ctg agc tca gta gta agt ggg att gtt 768
Asn Gln Leu Trp Ile Ile Ile Leu Ser Ser Val Val Ser Gly Ile Val
245 250 255

gtg atc act gca ctt acc tta aga tgc cta gtc cac aga cct gct gca 816
Val Ile Thr Ala Leu Thr Leu Arg Cys Leu Val His Arg Pro Ala Ala
260 265 270

agg tgg aga caa aga gaa atg ggg aga gcg cgg aaa tgg aaa aga tct 864
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35 40 45

Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile
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Tyr Trp Gln Lys Asp Asp Glu Met Val Leu Ala Val Met Ser Gly Lys
65 70 75 80

Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr
85 90 95

Asp Asn His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly
100 105 110

Lys Tyr Thr Cys Ile Ile Gln Lys Ile Gln Lys Gly Ser Tyr Lys Val
115 120 125

Lys His Leu Thr Ser Val Met Leu Leu Val Arg Ala Asp Phe Pro Val
130 135 140

Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His Asn Ile Lys Arg Phe
145 150 155 160

Met Cys Leu Thr Ser Gly Gly Phe Pro Lys Pro His Leu Ser Trp Leu
165 170 175

Glu Asn Glu Glu Glu Leu Asn Ala Ile Asn Thr Thr Val Ser Gln Asp
180 185 190

Pro Glu Thr Glu Leu Tyr Thr Ile Ser Ser Glu Leu Asp Phe Asn Met
195 200 205

Thr Asn Asn His Ser Phe Leu Cys Leu Val Lys Tyr Gly Asn Leu Ile
210 215 220

Val Ser Gln Ile Phe Asn Trp Gln Lys Ser Glu Pro Gln Pro Ser Asn
225 230 235 240

Asn Gln Leu Trp Ile Ile Ile Leu Ser Ser Val Val Ser Gly Ile Val
245 250 255

Val Ile Thr Ala Leu Thr Leu Arg Cys Leu Val His Arg Pro Ala Ala
260 265 270

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His Leu Ser Thr
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Val Met Ala Leu Leu Leu Ser Gly Val Ser Ser Met Lys Ser Gln Ala	
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tat ttc aac aag act gga gaa ctg cca tgc cat ttt aca aac tct caa	203
Tyr Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln	
35 40 45	
aac ata agc ctg gat gag ctg gta gta ttt tgg cag gac cag gat aag	251
Asn Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys	
50 55 60	
ctg gtt ctg tat gag ata ttc aga ggc aaa gag aac cct caa aat gtt	299
Leu Val Leu Tyr Glu Ile Phe Arg Gly Lys Glu Asn Pro Gln Asn Val	
65 70 75	
cat ctc aaa tat aag ggc cgt aca agc ttt gac aag gac aac tgg acc	347
His Leu Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr	
80 85 90 95	
ctg aga ctc cac aat gtt cag atc aag gac aag ggc aca tat cac tgt	395
Leu Arg Leu His Asn Val Gln Ile Lys Asp Lys Gly Thr Tyr His Cys	
100 105 110	
ttc att cat tat aaa ggg ccc aaa gga cta gtt ccc atg cac caa atg	443
Phe Ile His Tyr Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met	
115 120 125	
agt tct gac cta tca gtg ctt gct aac ttc agt caa cct gaa ata aca	491
Ser Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Thr	
130 135 140	
gta act tct aat aga aca gaa aat tct ggc atc ata aat ttg acc tgc	539
Val Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys	
145 150 155	
tca tct ata caa ggt tac cca gaa cct aag gag atg tat ttt cag cta	587
Ser Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu	
160 165 170 175	
aac act gag aat tca act act aag tat gat act gtc atg aag aaa tct	635
Asn Thr Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser	
180 185 190	

caa aat aat gtg aca gaa ctg tac aac gtt tct atc agc ttg cct ttt	683
Gln Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe	
195 200 205	
tca gtc cct gaa gca cac aat gtg agc gtc ttt tgt gcc ctg aaa ctg	731
Ser Val Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu	
210 215 220	
gag aca ctg gag atg ctg ctc tcc cta cct ttc aat ata gat gca caa	779
Glu Thr Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln	
225 230 235	
cct aag gat aaa gac cct gaa caa ggc cac ttc ctc tgg att gcg gct	827
Pro Lys Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala	
240 245 250 255	
gta ctt gta atg ttt gtt gtt ttt tgt ggg atg gtg tcc ttt aaa aca	875
Val Leu Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr	
260 265 270	
cta agg aaa agg aag aag aag cag cct ggc ccc tct cat gaa tgt gaa	923
Leu Arg Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu	
275 280 285	
acc atc aaa agg gag aga aaa gag agc aaa cag acc aac gaa aga gta	971
Thr Ile Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val	
290 295 300	
cca tac cac gta cct gag aga tct gat gaa gcc cag tgt gtt aac att	1019
Pro Tyr His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile	
305 310 315	
ttg aag aca gcc tca ggg gac aaa aat cag tag gaaaatgggtg gcttggcgtg	1072
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 35 40 45
 Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys Leu
 50 55 60
 Val Leu Tyr Glu Ile Phe Arg Gly Lys Glu Asn Pro Gln Asn Val His
 65 70 75 80
 Leu Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr Leu
 85 90 95
 Arg Leu His Asn Val Gln Ile Lys Asp Lys Gly Thr Tyr His Cys Phe
 100 105 110
 Ile His Tyr Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Ser
 115 120 125
 Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Thr Val
 130 135 140
 Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser
 145 150 155 160
 Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn
 165 170 175
 Thr Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln
 180 185 190
 Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser
 195 200 205
 Val Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu
 210 215 220
 Thr Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro
 225 230 235 240
 Lys Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val
 245 250 255
 Leu Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu
 260 265 270

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09303510.043066

Arg Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr
275 280 285

Ile Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro
290 295 300

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Lys Thr Ala Ser Gly Asp Lys Asn Gln
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1 5 10 15

gta aca gaa aac aag att ttg gtg aag cag ttg ccc agg ctt gtg gtg 96
Val Thr Glu Asn Lys Ile Leu Val Lys Gln Leu Pro Arg Leu Val Val
20 25 30

tac aac aat gag gtc aac ctt agc tgc aag tac act cac aac ttc ttc 144
Tyr Asn Asn Glu Val Asn Leu Ser Cys Lys Tyr Thr His Asn Phe Phe
35 40 45

tca aag gag ttc cgg gca tcc ctt tat aag gga gta gat agt gct gtg 192
Ser Lys Glu Phe Arg Ala Ser Leu Tyr Lys Gly Val Asp Ser Ala Val
50 55 60

gaa gtc tgc gtt gtg aat gga aat tac tcc cat cag cct cag ttc tac 240
Glu Val Cys Val Val Asn Gly Asn Tyr Ser His Gln Pro Gln Phe Tyr
65 70 75 80

tca agt aca gga ttc gac tgt gat ggg aaa ttg ggc aat gaa aca gtg 288
Ser Ser Thr Gly Phe Asp Cys Asp Gly Lys Leu Gly Asn Glu Thr Val
85 90 95

11
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 Thr Phe Tyr Leu Arg Asn Leu Phe Val Asn Gln Thr Asp Ile Tyr Phe
 100 105 110

tgc aaa att gaa gtc atg tat cca cct cct tac ata gac aat gag aag 384
 Cys Lys Ile Glu Val Met Tyr Pro Pro Pro Tyr Ile Asp Asn Glu Lys
 115 120 125

agc aat ggg acc att atc cac gtg aaa gag aaa cat ctt tgt cca gct 432
 Ser Asn Gly Thr Ile Ile His Val Lys Glu Lys His Leu Cys Pro Ala
 130 135 140

cag ctg tct cct gaa tct tcc aag cca ttt tgg gca ctg gtg gtg gtt 480
 Gln Leu Ser Pro Glu Ser Ser Lys Pro Phe Trp Ala Leu Val Val Val
 145 150 155 160

ggg gga atc cta ggt ttc tac agc ttg cta gca aca gtg gct ctt ggt 528
 Gly Gly Ile Leu Gly Phe Tyr Ser Leu Leu Ala Thr Val Ala Leu Gly
 165 170 175

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 Ala Cys Trp Met Lys Thr Lys Arg Ser Arg Ile Leu Gln Ser Asp Tyr
 180 185 190

atg aac atg acc ccc cgg agg cca ggg ccc acc cga agg cac tac caa 624
 Met Asn Met Thr Pro Arg Arg Pro Gly Pro Thr Arg Arg His Tyr Gln
 195 200 205

cct tac gcc cca gca cgc gac ttt gcg gca tac cgt tcc tgacatggac 673
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ccctatccag aagcc 688

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Tyr Asn Asn Glu Val Asn Leu Ser Cys Lys Tyr Thr His Asn Phe Phe

12
 154

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35 40 45
Ser Lys Glu Phe Arg Ala Ser Leu Tyr Lys Gly Val Asp Ser Ala Val
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Glu Val Cys Val Val Asn Gly Asn Tyr Ser His Gln Pro Gln Phe Tyr
65 70 75 80
Ser Ser Thr Gly Phe Asp Cys Asp Gly Lys Leu Gly Asn Glu Thr Val
85 90 95
Thr Phe Tyr Leu Arg Asn Leu Phe Val Asn Gln Thr Asp Ile Tyr Phe
100 105 110
Cys Lys Ile Glu Val Met Tyr Pro Pro Pro Tyr Ile Asp Asn Glu Lys
115 120 125
Ser Asn Gly Thr Ile Ile His Val Lys Glu Lys His Leu Cys Pro Ala
130 135 140
Gln Leu Ser Pro Glu Ser Ser Lys Pro Phe Trp Ala Leu Val Val Val
145 150 155 160
Gly Gly Ile Leu Gly Phe Tyr Ser Leu Leu Ala Thr Val Ala Leu Gly
165 170 175
Ala Cys Trp Met Lys Thr Lys Arg Ser Arg Ile Leu Gln Ser Asp Tyr
180 185 190
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195 200 205
Pro Tyr Ala Pro Ala Arg Asp Phe Ala Ala Tyr Arg Ser
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Phe Ser Leu Leu Phe Ile Pro Val Phe Ser Lys Gly Met His Val Ala	
30 35 40	
cac cct gca gtg gtg ctg gcc agc agc cga ggt gtc gcc agc ttc gtg	197
His Pro Ala Val Val Leu Ala Ser Ser Arg Gly Val Ala Ser Phe Val	
45 50 55	
tgt gaa tat ggg tct tca ggc aat gcc gcc aaa ttc cga gtg act gtg	245
Cys Glu Tyr Gly Ser Ser Gly Asn Ala Ala Lys Phe Arg Val Thr Val	
60 65 70	
ctg agg caa act ggc agc caa atg act gaa gtc tgt gct gcg aca tac	293
Leu Arg Gln Thr Gly Ser Gln Met Thr Glu Val Cys Ala Ala Thr Tyr	
75 80 85	
aca gtg gag aat gag ttg gcc ttc cta aat gat tcc acc tgc act ggc	341
Thr Val Glu Asn Glu Leu Ala Phe Leu Asn Asp Ser Thr Cys Thr Gly	
90 95 100 105	
atc tcc agc gga aac aaa gtg aac ctc acc atc caa ggg ttg agg gcc	389
Ile Ser Ser Gly Asn Lys Val Asn Leu Thr Ile Gln Gly Leu Arg Ala	
110 115 120	
atg gac acg gga ctc tac atc tgc aag gtg gag ctc atg tac cca cca	437
Met Asp Thr Gly Leu Tyr Ile Cys Lys Val Glu Leu Met Tyr Pro Pro	
125 130 135	
ccc tac tat gca ggc atg ggc aat gga acc cag att tat gtc atc gat	485
Pro Tyr Tyr Ala Gly Met Gly Asn Gly Thr Gln Ile Tyr Val Ile Asp	
140 145 150	
cct gaa cct tgc cca gat tct gac ttc ctc ctc tgg atc ctc gca gca	533
Pro Glu Pro Cys Pro Asp Ser Asp Phe Leu Leu Trp Ile Leu Ala Ala	
155 160 165	
gtc agt tca gga ttg ttt ttt tat agc ttc ctt atc aca gct gtt tct	581
Val Ser Ser Gly Leu Phe Phe Tyr Ser Phe Leu Ile Thr Ala Val Ser	
170 175 180 185	
ttg agc aaa atg cta aag aaa aga agc cct ctt act aca ggg gtc tat	629
Leu Ser Lys Met Leu Lys Lys Arg Ser Pro Leu Thr Thr Gly Val Tyr	

14

156

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	190		195		200	
gtg aaa atg ccc cca aca gag cca gaa tgt gaa aag caa ttt cag cct						677
Val Lys Met Pro Pro Thr Glu Pro Glu Cys Glu Lys Gln Phe Gln Pro						
	205		210		215	
tat ttt att ccc atc aat tga cacaccgtta tgaagaagga agaacactgt						728
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Val Phe Ser Lys Gly Met His Val Ala His Pro Ala Val Val Leu Ala						
35 40 45						
Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser Ser Gly						
50 55 60						
Asn Ala Ala Lys Phe Arg Val Thr Val Leu Arg Gln Thr Gly Ser Gln						
65 70 75 80						
Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asn Glu Leu Ala						
85 90 95						
Phe Leu Asn Asp Ser Thr Cys Thr Gly Ile Ser Ser Gly Asn Lys Val						
100 105 110						
Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu Tyr Ile						
115 120 125						
Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Ala Gly Met Gly						
130 135 140						
Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro Asp Ser						
145 150 155 160						

157

Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu Phe Phe
 165 170 175
 Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu Lys Lys
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